GEOMETRY.

368. Proposed by G. I. HOPKINS, Professor of Mathematics and Astronomy, Manchester High School, Manchester, N. H.

It is required to construct the triangle having given, base, vertical angle, and ratio of its altitude to sum of the other two sides.

369. Proposed by W. J. GREENSTREET, A. M., Editor, Mathematical Gazette, Stroud, England.

Prove by inversion that if two circles cut at a given angle, touch each a given circle, and pass each through the same fixed point, then shall the envelope of the points of contact be a conic.

370. Proposed by R. C. ARCHIBALD, Paris, France.

The trisectors of the angles of any triangle ABC are, in order, AF, AE, CE, CD, BO, BF. Show synthetically that D, E, F are the vertices of an equilateral triangle.

CALCULUS.

295. Proposed by C. E. FLANNAGAN, Wheeling, W. Va.

A hawk can fly v feet per second, a hare can run v' feet per second. The hawk, when a feet vertically above the hare, gives chase and catches the hare when the hare has run b feet. Find the length of the curve of pursuit. [Echols' *Differential and Integral Calculus*, page 253, Ex. 20.]

296. Proposed by C. N. SCHMALL, New York City.

Two currents C_1 and C_2 produce deflections ϕ_1, ϕ_2, respectively, in a tangent galvanometer. When is $(\phi_1-\phi_2)$ a maximum?

MECHANICS.

249. Proposed by G. B. M. ZERR, A. M., Ph. D., Philadelphia, Pa.

A load P is supported by three strings of equal size attached at the vertices of a triangle sides a, b, c lying in a horizontal plane. The load is vertically under the centroid of the triangle at a distance h from it. Find the stresses in the strings.

250. Proposed by C. N. SCHMALL, New York City.

A smooth circular table is surrounded by a smooth vertical rim. A ball of elasticity e is projected from a point at the rim in a line making an angle ϕ with the radius through that point. Show that the ball will return to the starting point after the second impact if

$$\tan\phi = \sqrt{\frac{e^3}{e^2+e+1}}.$$

NUMBER THEORY AND DIOPHANTINE ANALYSIS.

174. Proposed by B. KRAMER, Student, University of Pittsburg, Pittsburg, Pa.

Find a general solution of $x(x+a)=y^2$, a, x, and y being integers. Given a, required to find x to satisfy conditions.